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Examining the determinants of resilience and mental stress in emergency department nurses

Zahra Kamari¹, Ali Akbar Vaisi Raygani^{1*}, Nader Salari², Behnam Khaledi-Paveh³ and Mohammad Mehdi Mohammadi¹

Abstract

Background Emergency departments (ED) are characterized by highly dynamic environments. This study aimed to identify determinants of resilience and mental stress among ED nurses.

Methods A cross-sectional, analytical design was employed to assess 316 emergency nurses in Kermanshah hospitals using a convenience sampling method. The Connor-Davidson Resilience Scale and the Perceived Stress Scale measured resilience and mental stress, respectively. Data were analyzed using independent t-tests, ANOVA, chi-square tests, and Pearson's correlation in SPSS version 25.

Results The average mental stress score was 26.9, and the average resilience score was 64, indicating moderate levels. Significant relationships were found between employment status, emergency responsibility, economic status, and resilience ($P < 0.01$). Additionally, place of residence, number of children, education, shift work, social network presence, employment status, emergency responsibility, and economic status were significantly related to psychological stress ($P < 0.01$). Pearson's correlation showed an inverse relationship between resilience and mental stress ($r = -0.123$, $P = 0.029$). Age was inversely related to mental stress ($r = -0.408$, $P < 0.001$), while overtime hours per month were directly related to resilience ($r = 0.135$, $P = 0.016$) and inversely related to mental stress ($r = -0.482$, $P = 0.029$).

Conclusion The research highlights the importance of considering demographic variables in managing nurses' resilience and mental pressure, emphasizing the need for hospital officials to focus on work shifts, employment status, and economic conditions.

Keywords Resilience, Stress, Psychological, Emergency nursing

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Background

The emergency department (ED) is a vital hospital unit providing immediate care to acutely ill patients, with approximately 28% of hospital admissions occurring through the ED [1]. ED nurses, responsible for direct patient care, work in a dynamic environment characterized by high workload and rapid changes in patient conditions, leading to increased stress, burnout, and potential turnover [2, 3].

Nursing is generally recognized as a high-stress profession, with nurses exposed to various physical and psychological pressures [4]. The specific department and work environment in which nurses work play a critical role in determining their stress levels [5]. The ED presents unique challenges, such as patients' critical conditions, exposure to the public, public scrutiny of nursing skills, fear of treatment failures, and time constraints [6, 7].

Factors such as globalization, increasing competition, rising migration, and changes in employment patterns have contributed to heightened psychological stress in workplaces [8, 9]. Stress, as a global phenomenon, affects all segments of society regardless of age, gender, race, socioeconomic status, or education level [10]. While some stress is normal and even essential for life, chronic or excessive stress, particularly in the absence of adequate coping mechanisms or sufficient support, can negatively impact individuals' health [11].

The workplace is one of the primary sources of psychological stress [12]. Occupational stress has become a pervasive and costly issue, affecting both individual health and organizational performance [13]. Unmanaged occupational stress can compromise the quality of work and jeopardize employees' mental health [14]. Healthcare workers, especially nurses working in hospitals, are exposed to high levels of occupational stress due to the nature of their work. Nursing is considered a high-risk profession for fatigue and illness [14–16].

Nursing in the ED is associated with high levels of occupational stress [17]. In addition to the general stressors associated with the nursing profession, ED nurses face unique challenges such as fluctuations in patient volume, rapid changes in patients' conditions, and the management of traumatic events and conflicts [18, 19]. High workload, exposure to patient mortality, unpredictable work patterns, shift work, inadequate psychological support, ambiguity in authority, and increasing bureaucratic burdens are among the factors that exacerbate occupational stress among nurses [20, 21].

Resilience is a critical factor for ED nurses facing high levels of occupational stress. It empowers them to cope with stressors such as critically ill patients, exposure to trauma, and time constraints, ultimately reducing burnout and promoting well-being. Resilience, defined as the ability to adapt to adverse conditions, equips nurses with

positive coping strategies. Fostering resilience is essential for creating positive work environments and enhancing patient care [22–27].

Considering the inherently stressful nature of nursing and individual variations in resilience and psychological pressure, this study examines the relationship between demographic factors, resilience, and psychological stress among ED nurses at Kermanshah University Hospitals in 2023. These hospitals serve as major referral centers for a large population in western Iran, managing a wide range of emergency cases, including trauma, cardiovascular diseases, and infectious diseases. The dynamic and high-pressure nature of the EDs in these hospitals, along with the diverse patient conditions, create a unique and challenging environment for nurses. This setting may influence the resilience and mental stress levels of nurses working in this environment and provide valuable insights into the factors affecting their well-being. Moreover, understanding how demographic factors interact with resilience and stress in this specific context can help develop targeted strategies to support nurses' mental health and enhance the quality of patient care.

Methods

Study design and participants

This research employed a cross-sectional design with a correlational analytical approach. The study population comprised nurses working in the emergency departments of hospitals in Kermanshah, Iran. The eligible nurses were included in the study using a non-probability convenience sampling method. Data were collected between January and April 2023. Data for this study were collected from a total of 14 hospitals located in Kermanshah, Iran. To ensure a diverse sample and enhance the generalizability of the findings, the participating hospitals included two distinct categories: seven university-affiliated teaching hospitals and seven non-teaching hospitals.

Participants were included in this study based on the following inclusion criteria: [1] a minimum of one year of overall nursing experience; [2] at least six months of recent direct experience in an emergency department (ED); and [3] possession of a Bachelor of Science in Nursing (BSN) degree or higher. The focus on registered nurses (RNs) with a BSN or higher was deliberate. Within the study setting, RNs with a BSN or higher assume primary responsibility for direct patient care, encompassing assessment, diagnosis, intervention, and evaluation. Their scope of practice and decision-making authority within the ED are substantially broader than those of other healthcare personnel, such as assistant nurses, nurse aides, operating room technicians, or anesthesia technicians. Although these professionals are valuable members of the ED team, their roles are typically more specialized or supportive.

The only exclusion criterion was voluntary withdrawal from the study.

Sample size calculation

The sample size was determined using a correlation power analysis, with parameters set at a 95% confidence level and a power of $1-\beta$. Determining the sample size based on the study of Sharai Nia et al. (2018), the variance of psychological pressure is equal to 0.52 [1].

$$\sigma = 0.52$$

$$d = 0.05$$

$$z_{1-\frac{\alpha}{2}} = z_{1-\frac{0.05}{2}} = z_{0.975} = 1.96$$

$$n = \frac{(z_{1-\frac{\alpha}{2}})^2 \times (\sigma)^2}{(d)^2} = \frac{(z_{0.975} + z_{0.90})^2 \times (0.52)^2}{(0.05)^2}$$

$$\begin{aligned} n &= \frac{(1.96)^2 \times (0.27)}{(0.05)^2} = \frac{(3.24) \times (0.27)}{(0.0025)} \\ &= \frac{(3.24) \times (0.27)}{(0.0025)} = \frac{(0.14)}{(0.0025)} \end{aligned}$$

$$n \geq 56$$

Prior to commencing data collection, a power analysis was conducted to determine the minimum sample size required to detect statistically significant effects. This analysis indicated a minimum of 56 participants, which was increased to 60 to account for a potential 10% attrition rate. However, given the accessibility of a larger pool of eligible nurses working in the emergency departments of the 14 participating hospitals in Kermanshah, a larger sample was recruited to enhance the statistical power and generalizability of the findings. Ultimately, data were collected from 316 nurses who met the inclusion criteria.

Data collection

Data were collected using the following instruments: a demographic questionnaire, Connor-Davidson Resilience Scale (2003) [28], and Cohen et al.'s Perceived Stress Scale (1983) [29].

After obtaining the necessary ethical approvals, participants were informed about the study's objectives and assured of the confidentiality of their responses. Written informed consent was obtained from all participants prior to data collection.

Demographic information questionnaire

A researcher-developed demographic questionnaire was administered to collect data on participants' age, sex, marital status, overtime hours, employment type, ED

type, work experience, emergency room experience, economic status, education level, number of children, shift work, and emergency responsibilities.

Perceived stress scale (Cohen et al., 1983)

The 14-item Perceived Stress Scale (PSS), developed by Cohen et al. in 1983, measures general perceived psychological stress within the past month. The scale assesses thoughts and feelings related to stressful events, perceived control, coping mechanisms, and experienced psychological stress. Additionally, it examines risk factors for behavioral disorders and the process of stressful relationships [29].

Widely used and translated into multiple languages, the PSS has been standardized in numerous countries. Its reliability has been demonstrated in several studies, with Cronbach's alpha coefficients ranging from 0.74 to 0.86 [30, 31].

The PSS employs a four-point Likert scale (never = 0 to very much = 4), yielding a minimum score of 0 and a maximum of 56. Higher scores reflect greater perceived psychological stress. Cohen et al. (1983) reported criterion validity coefficients between 0.52 and 0.76 based on correlations with physiological measures. Construct validity was supported by a correlation of 0.63 with a researcher-developed criterion measure [29, 31]. The PSS was translated and standardized into Persian by Nari-mani and Abul Qasimi (2004) with a reliability coefficient of 0.84 [32].

The Connor-Davidson Resilience Scale (CD-RISC)

Developed by Connor and Davidson (2003), the 25-item Connor-Davidson Resilience Scale (CD-RISC) assesses resilience based on a comprehensive literature review. The scale has demonstrated psychometric soundness across various populations, including the general population, primary care patients, and psychiatric outpatients. The CD-RISC effectively differentiates between resilient and non-resilient individuals in both clinical and non-clinical settings [28].

Mohammadi adapted the CD-RISC for use in Iran, reporting a Cronbach's alpha of 0.89 for reliability. Construct validity was established through item-total correlations and factor analysis [33]. Subsequent studies by Haddadi (2010) further supported the scale's reliability and validity in Iranian samples [34].

The CD-RISC employs a four-point Likert scale (completely false to always true), with higher scores indicating greater resilience. A cutoff score of 50 is commonly used to classify individuals as resilient or non-resilient. A score of 50 or higher is considered indicative of resilience in individuals.

Following the approval of the research protocol and the completion of necessary administrative procedures,

Table 1 Description of demographic and occupational variables in nurses working in emergency (Kermanshah hospitals in 2023)

Variable		Frequency	Percentage
Gender	Female	180	55.6
	Male	144	44.4
Marital status	Married	181	55.9
	Single	120	37
	Widow	12	3.7
	Divorcee	11	3.4
Number of children	Having no children	153	47.2
	1	72	22.2
	2	70	21.6
	3	22	6.8
	4	7	2.2
Education	Bachelor	241	74.4
	Master's degree	83	25.6
Employment status	Official	181	55.9
	A treaty	16	4.9
	Contractual	62	19.1
	Corporate	17	5.2
	Service obligation	48	14.8
ED Type	Hospitalization	181	55.9
	Ambulatory	143	44.1
Responsibility in the emergency room	Bedside nurse	189	58.3
	Head nurse	67	20.7
	Emergency supervisor	42	13
	Triage nurse	26	8
Economic situation	Satisfied with the situation	47	14.5
	Moderate	236	72.5
	Dissatisfied with the situation	42	13
Home ownership status	Personal	197	60.8
	Rental	127	39.2
The amount of presence in social networks	Very little	73	22.5
	Low	143	44.1
	Moderate	55	17
	a lot	38	11.7
	Too much	15	4.6
Place of residence	City	268	82.7
	The suburbs	56	17.3
Type of hospital	Public	286	88.3
	Private	38	11.7
	Standard deviation $\pm$ mean	Minimum	Maximum
Age	6.6 $\pm$ 34.5	22	56
Work experience (years)	5.4 $\pm$ 6.9	1	28
Experience working in ED (years)	3.8 $\pm$ 4	0.8	20
Overtime hours per month	51.6 $\pm$ 80.4	0	200

including obtaining ethical approval from the Research Ethics Committee of Kermanshah University of Medical Sciences, data collection commenced. An electronic questionnaire was developed using the Digit system and a unique link was generated. In collaboration with the educational supervisors of the selected hospitals, this link was disseminated to eligible nursing staff via email. Participants were invited to complete the questionnaire by accessing the provided link.

To ensure a high response rate, several measures were implemented. Initially, all eligible nurses received an email explaining the study's purpose and emphasizing the importance of their participation. The email contained a unique link to the electronic questionnaire, allowing nurses to access it directly. A week after the initial invitation, a follow-up email was sent to those who had not yet completed the questionnaire, gently reminding them of the study and encouraging their involvement. The questionnaire was designed to be user-friendly and could be completed in approximately 15 min. To ensure data security, the questionnaire was hosted on a secure server, and all data was transmitted using encryption protocols. Participants were informed about data security measures and assured of the confidentiality of their responses.

Data analysis

Data analysis was performed using SPSS version 25. Descriptive statistics were employed to summarize the data. These included frequency distributions, measures of central tendency (mean) and dispersion (standard deviation) for quantitative variables, and percentages for categorical variables. To test the study hypotheses, independent t-tests, analysis of variance, chi-square tests, and Pearson correlation coefficients were employed. The level of significance for all statistical tests was set at $\alpha = 0.05$.

In this study, resilience and mental stress were considered as the outcome variables, while age, gender, marital status, overtime hours, employment type, type of emergency department, work experience, experience in emergency departments, economic status, education level, number of children, shift type, and emergency responsibilities were considered as independent variables.

Results

A total of 316 emergency room nurses participated in this study. The participants had a mean age of 34.5 years ($SD = 6.6$), ranging from 22 to 56 years. Their mean years of experience were 4 years ($SD = 3.8$). Of the participants, 55.5% were female, 55.9% were married, and 74.4% held a bachelor's degree. Additional demographic information is presented in Table 1.

The mean mental stress score was 26.9 ($SD = 8.3$), ranging from 2 to 46, indicating a moderate level of mental stress. The mean resilience score was 64 ($SD = 14.4$),

with a minimum of 13 and a maximum of 96. No significant differences were found in resilience scores based on gender, home ownership status, workplace emergency preparedness, place of residence, or type of hospital ($p > 0.05$). Analysis of variance revealed significant

Table 2 Comparison of mean resilience scores by demographic and occupational variables among emergency room nurses (Kermanshah hospitals in 2023)

Variable		Mean $\pm$ standard deviation	Statistical test	Significant level
Gender	Female	15.01 $\pm$ 62.9	-1.5	0.136
	Male	13.6 $\pm$ 65.3		
Marital status	Married	13.8 $\pm$ 66.01	1.8	0.130
	Single	14.9 $\pm$ 62.03		
	Widow	9.5 $\pm$ 60.8		
	Divorcee	18.02 $\pm$ 57.7		
	Having no children	14.7 $\pm$ 61.9		
Number of children	1	13.4 $\pm$ 66.7	1.7	0.129
	2	14.7 $\pm$ 65.7		
	3	10.09 $\pm$ 63		
	4	19.9 $\pm$ 67.2		
Education	Bachelor	15.02 $\pm$ 64.01	0.771	0.461
	Master's degree	12.1 $\pm$ 63.3		
	PhD	13.2 $\pm$ 69.6		
Employment status	Official	13.2 $\pm$ 66.2	3.9	0.004
	A treaty	15.4 $\pm$ 62.7		
	Contractual	13.7 $\pm$ 62.8		
	Corporate	12.6 $\pm$ 63.9		
ED Type	Service obligation	17.7 $\pm$ 57.2	-0.198	0.843
	Hospitalization	12.5 $\pm$ 63.8		
	Ambulatory	16.3 $\pm$ 64.2		
Responsibility in the emergency room	Bedside nurse	15.2 $\pm$ 61.7	3.8	0.009
	Head nurse	11.6 $\pm$ 66.3		
	Emergency supervisor	13.6 $\pm$ 68.3		
	Triage nurse	13.3 $\pm$ 67.1		
Economic situation	Satisfied with the situation	13.6 $\pm$ 66.5	7.06	0.001
	Moderate	14.1 $\pm$ 64.8		
	Dissatisfied with the situation	14.8 $\pm$ 56.4		
Home ownership status	Personal	15.01 $\pm$ 65.08	1.6	0.1
	Rental	13.2 $\pm$ 62.3		
The amount of presence in social networks	Very little	12.9 $\pm$ 64.9	1.6	0.1
	Low	13.9 $\pm$ 65.05		
	Moderate	16.1 $\pm$ 60.2		
	A lot	14.5 $\pm$ 65.7		
Place of residence	Too much	17.2 $\pm$ 59.5	0.371	0.711
	City	14.6 $\pm$ 64.1		
	The suburbs	13.2 $\pm$ 63.3		
Type of hospital	Public	14.4 $\pm$ 64.1	0.404	0.686
	Private	14.4 $\pm$ 63.1		

differences in resilience scores based on employment status, responsibility in the emergency room, and economic situation ($p < 0.05$) (Table 2).

No statistically significant differences in mean mental stress scores were found among ED nurses based on gender, home ownership status, or type of hospital ($p > 0.05$). However, significant differences were observed in mental stress scores according to workplace emergency status ($p < 0.05$), with nurses in outpatient departments reporting higher levels of stress compared to those in inpatient departments. Additionally, nurses residing in urban areas exhibited significantly higher mean mental stress scores than those living in suburban areas ($p < 0.05$). Marital status was not associated with mental stress levels among ED nurses ($p > 0.05$).

Analysis of variance revealed significant differences in mean mental stress scores based on number of children, education level, shift work, social network participation, employment status, emergency room responsibilities, and economic status ($p < 0.05$) (Table 3).

Pearson correlation analysis revealed a significant negative correlation between mental stress and resilience ($r = -0.123$, $p < 0.05$), indicating that as resilience increased, mental stress decreased. Additionally, a significant negative correlation was found between age and mental stress ($r = -0.408$, $p < 0.001$), suggesting that older nurses experienced lower levels of mental stress. Overtime hours per month were positively correlated with resilience ($r = 0.135$, $p = 0.016$) and negatively correlated with mental stress ($r = -0.482$, $p < 0.001$), indicating that nurses who worked more overtime hours had higher levels of resilience but also experienced higher levels of mental stress. No significant correlations were found between work experience, resilience, and mental stress ($p > 0.05$). Similarly, no significant relationships were observed between years of experience in the emergency room and resilience or mental stress ($p > 0.05$). These findings are summarized in Table 4.

Discussion

Results indicated significant associations between resilience and employment status, emergency responsibilities, and economic status among ED nurses. Specifically, officially employed nurses exhibited higher mean resilience scores compared to other employment categories, while nurses undergoing mandatory service (mandatory service nurses) reported lower resilience levels. These findings align with previous research by Garrosa et al. and Graminejad et al., who also reported lower resilience among plan and corporate nurses [35, 36].

Potential explanations for these findings include the greater job security and benefits associated with official employment, which may contribute to increased job satisfaction and lower stress levels. Conversely, contractual

Table 3 Comparison of mean mental stress scores by demographic and occupational variables among emergency room nurses (Kermanshah hospitals in 2023)

Variable		Mean $\pm$ standard deviation	Test statistics	Significant level
Gender	Female	8.7 $\pm$ 26.7	-0.432	0.666
	Male	7.8 $\pm$ 27.1		
Marital status	Married	8.9 $\pm$ 26.2	2.2	0.085
	Single	7.4 $\pm$ 27.9		
	Widow	9.3 $\pm$ 23.6		
	Divorcee	4.2 $\pm$ 30.4		
Number of children	Having no children	6.6 $\pm$ 29.4	9.6	0.001
	1	8.3 $\pm$ 26.8		
	2	9.2 $\pm$ 22.8		
	3	9.9 $\pm$ 23.7		
	4	9.2 $\pm$ 22.2		
Education	Bachelor	8.1 $\pm$ 28.2	12.7	0.001
	Master's degree	7.5 $\pm$ 23		
	PhD	10.2 $\pm$ 22.2		
Employment status	Official	8.9 $\pm$ 25.5	7.4	0.001
	A treaty	5.4 $\pm$ 28.4		
	Contractual	8.3 $\pm$ 25.8		
	Corporate	6.1 $\pm$ 30.8		
	Service obligation	4.2 $\pm$ 32.1		
ED Type	Hospitalization	8.6 $\pm$ 24.3	-6.4	0.001
	Ambulatory	6.8 $\pm$ 30.1		
Responsibility in the emergency room	Bedside nurse	6.5 $\pm$ 29.6	25.3	0.001
	Head nurse	8.6 $\pm$ 21.4		
	Emergency supervisor	9.8 $\pm$ 22.4		
	Triage nurse	6.1 $\pm$ 29.6		
Economic situation	Satisfied with the situation	5.2 $\pm$ 31.09	10.1	0.001
	Moderate	8.3 $\pm$ 26.9		
	Dissatisfied with the situation	9 $\pm$ 23.2		
Home ownership status	Personal	8.6 $\pm$ 26.2	-1.7	0.078
	Rental	7.8 $\pm$ 27.9		
The amount of presence in social networks	Very little	8.07 $\pm$ 22.2	12.8	0.001
	Low	7.9 $\pm$ 28.8		
	Moderate	6.3 $\pm$ 29.8		
	A lot	9.2 $\pm$ 23.4		
	Too much	6.2 $\pm$ 29.7		
Place of residence	City	8.3 $\pm$ 27.4	2.4	0.014
	The suburbs	8.2 $\pm$ 24.4		
Type of hospital	Public	8.2 $\pm$ 27.2	1.6	0.099
	Private	8.8 $\pm$ 24.8		

employees often face job insecurity, lower wages, and fewer benefits, potentially leading to heightened psychological distress and reduced resilience [37, 38].

Furthermore, resilience levels varied significantly based on job responsibility within the emergency department.

Table 4 Correlation coefficients between resilience scales and mental stress with quantitative variables among emergency department nurses (Kermanshah hospitals in 2023)

Variables	Resilience		Mental stress	
	Correlation coefficient	Significance level	Correlation coefficient	Significance level
Age	0.105	0.062	-0.408	0.001
Work history	0.008	0.890	-0.104	0.064
Work experience in emergency room	-0.093	0.097	-0.018	0.756
Overtime hours per month	0.135	0.016	-0.482	0.001

ED supervisors exhibited the highest levels of resilience, while bedside nurses reported the lowest. Paradoxically, despite greater responsibilities, supervisors demonstrated higher resilience, suggesting potential factors contributing to their role selection [39–41].

Emergency and intensive care environments are characterized by demanding workloads and increased risk of burnout, job dissatisfaction, and turnover intentions [42, 43]. High resilience is crucial for nurses in these settings, enabling them to effectively cope with stress and maintain professional well-being. Our findings align with those of [30, 44] who emphasized the importance of resilience in high-pressure environments.

However, these results contradict the findings of Sotoodeh et al. (2021), who reported no significant differences in resilience between head nurses and staff nurses in a special care unit [45]. This discrepancy might be attributed to the distinct nature of emergency departments, which pose unique challenges compared to other units.

While our findings suggest that resilience levels vary significantly based on job responsibility within the emergency department, these results contradict those of Sotoodeh et al. (2021) who reported no significant differences in resilience between head nurses and staff nurses in a special care unit [45]. This discrepancy might be attributed to several factors, including differences in methodology (e.g., study design, measurement tools, variables examined), cultural contexts (e.g., healthcare system), and sample characteristics (e.g., sample size, demographic profiles, and the specific department studied). EDs and special care units differ significantly in terms of patient acuity, workload, and other factors that could influence nurses' resilience levels. Further research is needed to explore these potential contributing factors in greater depth.

Our findings revealed a significant association between economic status and resilience among ED nurses. Specifically, nurses with higher economic status exhibited greater resilience compared to those with lower economic status. This finding aligns with the notion that

economic factors can significantly influence individual well-being, particularly in challenging professions such as nursing.

Given the demanding nature of nursing, financial stress can exacerbate burnout and diminish resilience. Nurses facing economic hardship may experience increased anxiety and decreased job satisfaction, hindering their ability to provide optimal patient care. The current economic climate in Iran may exacerbate these challenges, as financial concerns can compound the stressors associated with the nursing profession [46–48].

The identified associations between employment status, job responsibilities, and economic status with resilience levels suggest that contract nurses and nurses undergoing mandatory service (mandatory service nurses), particularly those with lower socioeconomic positions and inpatient roles, may exhibit reduced adaptive capacities. Individuals with low resilience often struggle to build strong social support networks, make sound decisions under pressure, and recover from adversity. They may experience difficulty setting and achieving goals, cope ineffectively with stress, and exhibit poor emotional regulation. Consequently, they may feel overwhelmed, helpless, and incapable of handling challenges, leading to impulsive decisions and a perceived lack of control over their lives [33].

However, significant differences in mental stress emerged based on the ED setting. Nurses in outpatient departments reported higher mean stress scores compared to those in inpatient units. This finding is consistent with the work of Falahat Pisheh et al. [49]. The increased stress experienced by outpatient nurses may be attributed to the often unpredictable and acute nature of patient conditions, leading to heightened anxiety and pressure. In contrast, inpatient settings typically involve more stable patient conditions, potentially contributing to a more controlled and less stressful work environment.

Our findings also revealed a significant difference in mean mental stress scores based on place of residence, with urban-dwelling nurses reporting higher levels of stress compared to suburban counterparts. This disparity may be attributed to the heightened psychological demands associated with urban living, including financial pressures, housing costs, and child-related concerns.

Additionally, the number of children was found to significantly influence mental stress levels. Nurses with two or three children reported higher mean stress scores compared to those with no or one child. The demands of childcare, coupled with the already stressful nature of nursing, may contribute to increased psychological burden among nurses with multiple children.

Our findings revealed significant differences in mental stress levels among different nurse categories. Project nurses experienced higher levels of stress compared to

permanent staff due to job insecurity and career uncertainty. Additionally, nurses working rotating shifts (two or three shifts) reported higher stress levels than those on fixed shifts (one shift), aligning with the findings of Falahat Pisheh et al. but contradicting those of Abdi [49, 50]. Irregular work schedules associated with rotating shifts can disrupt sleep patterns and daily routines, contributing to increased stress.

Furthermore, nurses with lower educational qualifications exhibited higher levels of mental stress compared to those with higher degrees, contrary to the findings of Abdi [50]. A higher education level may equip nurses with better problem-solving skills, increased job satisfaction, and enhanced career prospects, potentially mitigating stress.

Additionally, we observed a positive correlation between social media use and mental stress levels. While this novel finding warrants further investigation, it is possible that the constant connectivity associated with social media may contribute to increased feelings of overwhelm and burnout among nurses. Future studies could explore the specific mechanisms underlying this relationship, such as the impact of social comparison or information overload.

Conclusion

Our findings indicate that nurses' resilience is significantly correlated with their employment status, job responsibilities within the emergency department, and socioeconomic status. Moreover, factors such as place of residence, number of children, educational attainment, work shift patterns, social media use, and the aforementioned employment-related variables influence the level of mental stress experienced by ED nurses. A significant inverse relationship was observed between resilience and mental stress, suggesting that higher levels of resilience are associated with lower levels of stress. This study highlights the importance of considering demographic and occupational factors when examining the mental health and well-being of ED nurses. Our results underscore the need for healthcare organizations to prioritize the support and well-being of their nursing staff, particularly in terms of work-life balance, job security, and socioeconomic support. Given the significant findings regarding resilience and mental stress, we recommend implementing interventions and strategies to enhance resilience, reduce stress, and address job insecurity among ED nurses.

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Author contributions

AAVR, ZK, BKP, NS, and MMM conceptualized, analyzed and interpreted the data, and drafted the manuscript. AAVR, ZK, NS designed the study and participated in the analysis and interpretation of data. All authors coordinated the study, revised the manuscript, edited and approved the final version to be submitted for publication, and helped in the analysis and interpretation of data.

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Data availability

The data analyzed and materials used in this study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

In accordance with the Declaration of Helsinki and principles of ethical research, this study was approved by the Ethics Committee of Kermanshah University of Medical Sciences (Ethics code: IR.KUMS.REC.1401.080). Participants were assured of the confidentiality of their data. They were also informed of their right to withdraw from the study at any time. Informed consent was obtained from all individual participants included in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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